

System/Environment (System/Umwelt)

The distinction system/environment is the starting point for Luhmann's systems theory. No system is independent of its environment, since a system is constituted drawing a boundary through its operations and thereby differentiating itself from what does not belong to it, i.e., its environment. No system can operate outside of its boundaries [*→Operation/Observation*]. Without an environment to distinguish it from, no system could be determined. A system is an autonomous domain in which particular conditions apply that escape one-to-one correspondence with the states in the environment [*→Autopoiesis*].

Defining a boundary does not mean isolating the system. Operations are always internal operations, but at the level of observation the boundary can be overcome and different forms of interdependence between system and environment can be identified. Every system needs a whole range of environmental conditions: a social system, for instance, requires the availability of psychic systems that participate in the communication, alongside a compatible physical environment (e.g., temperatures within a particular range, appropriate levels of gravity) and many other conditions. In addition, one and the same event can belong simultaneously to the system and to its environment. A particular event can, for instance, be an element of both a social system (as a communication) and a psychic system (as thought), even though these systems reciprocally belong to the environment of the other [*→Interpenetration and Structural Coupling*]. This *→event* is subject to conditions that are always different inside the system and in its environment.

The environment, for its part, is not environment in and of itself, but rather the environment of a system for which it is the outside ("everything else"). Concerning a system, everything that does not fall within the system belongs to the environment, which is thus different for every system. In fact, the environment is constituted by a system's operations as what is left out (as "negative correlate": it includes everything that does not belong to the system)

and is itself not a system: it has neither its own operations, nor its own capacity for action. $\rightarrow$ *Attribution* to the environment is a system-internal strategy for managing its own complexity. Unlike the system, the environment is not defined by boundaries, but by horizons that cannot be overcome because they expand with the increase in the system complexity: the horizon moves further away the closer we get to it.

That the environment is relative to one system implies neither the devaluation of the environment nor the subordination of its role. The starting point of the theory is neither the system nor the environment, but rather their difference [$\rightarrow$ *Identity/Difference*], for which both sides are equally necessary. There can be no constitution of a system without a relationship to the environment, and also no environment without a system: they only ever exist together. On the one hand, the capacity for action is a characteristic of a system and forms an asymmetry in the system/environment relation—which is also expressed in the fact that only in the system a $\rightarrow$ *re-entry* of the distinction can take place. On the other hand, the environment is the side with higher complexity.

The distinction system/environment stabilizes a $\rightarrow$ *complexity* gap that forces the system to constantly make selections and imposes contingency on all operations: the environment always includes more possibilities than the system can actualize. Even if it is always relative to the respective system, the environment is not available for its needs passively and without resistance: it has its own forms and its own needs that the system must face. In a completely chaotic and entropic environment, however, it would not be possible to constitute a system. The environment must have at least enough order to allow the making and maintenance of distinctions [$\rightarrow$ *Constructivism*].

In order to understand the structuring and the autonomous dynamic of the environment, the distinction between the environment of a system and the systems in its environment must be taken into account. Each of these systems orient themselves to their own system/environment distinctions and include the first system in their environments. The environment of a communication system includes, for instance, a multiplicity of organisms, psychic systems and further social systems, each of which is characterized by a specific autopoiesis and is influenced only minimally by the operations of the social system itself. No system has access to the system/environment relation of other systems. For this reason, the environment of a system—which is constituted by the system itself—appears to the system as a complex network of mutually influencing system/environment distinctions, which the system cannot determine.

The environment is always much more complex than the system, and this asymmetry cannot be reversed. Every attempt that the system makes to control its environment means a change in the environments of other systems, which react making the environment of the first system yet more complex, and thereby reproduces the complexity gap.

This gap forces the system to undertake sharper selections concerning the environment than it does concerning itself. Environmental complexity is processed globally. The system reacts with higher sensitivity to internal events and processes than it does for events and processes in the environment (it could not take all of them into account anyway). It is relatively indifferent to environmental circumstances. Internal or external attribution is itself, however, an internal strategy for the orientation of the system operations: what is localized externally depends on internal structures, and in the orientation to the environment the system reacts to something that it constructed itself (but cannot necessarily control). The economic system can, for instance, attribute a stock market crash to itself as a consequence of its operations, or to the environment as a consequence of political events, emotional business people or other factors.

When the question of *→rationality* is posed, there is a re-entry of the system/environment distinction into the system, which processes its relation to the environment internally. Thus the economic system can ask itself, for instance, how its own processes affected the operation of politics, and whether the consequences triggered the events that caused the stock market crash.

No datum can be ultimately located in the system or in the environment, but rather belongs simultaneously to a system and to the environment of other systems, depending on the observation perspective. Every observation must specify its own system reference—i.e., the observer doing the observing—and cannot rely on the assumption of a given reality.

The distinction system/environment can be repeated within the system. The system itself represents an environment for the differentiation of subsystems, which constitute their own system/environment distinctions presupposing the overall complexity reduction by the system towards the undetermined environment [*→Differentiation; →Differentiation of Society*]. [E.E.]

